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Cont.-US

In re Patent Application of:
Klaus-Dieter NITTEL, et al.

Group Art Unit: 1793

Examiner: George Wyszomierski

For: METHOD FOR APPLYING MANGANESE
PHOSPHATE LAYERS

Dear Sir:

DECLARATION UNDER RULE 132

Sir:

1. I am Ralf Schneider, a materials' science investigator employed by the assignee of the present invention. I have three (3) years education in materials' science development and testing and attended five (5) years of evening school in mechanical engineering. I have been employed by Chemetall GmbH since 1995 and I have been working in the field of manganese phosphating since then.
2. I am familiar with the patent application, and I am familiar with the Office Action dated June 30, 2008.
3. I submit this declaration in view of the Examiner's analysis of the application, particularly the Examiner's 35 U.S.C. § 103(a) rejections of claims 17-19 and 22 over U.S. Patent No. 3,860,455 (Hansen) in view of U.S. Patent No. 2,375,468 (Clifford), and of the

remaining claims over Hansen and Clifford in view of either U.S. Patent No. 5,795,408 (Bittner), U.S. Patent No. 4,824,490 (Oei) or U.S. Patent No. 2,987,427 (Shaw).

4. I have reviewed all of the cited references with a particular focus on Example 1 with the bath of Experiment C of Hansen et al. ("Hansen"), which relates to a manganese phosphating without nitroguanidine for the coating of steel.

5. Because of the longer pickling time and therefore stronger pickling effect of the manganese phosphate solution according to Hansen in comparison to the present invention, the roughness R_z of the generated coatings according to Hansen should be significantly higher.

6. According to my experience, the pickling time for manganese phosphate solutions according to the present application containing nitroguanidine is about half the time than for corresponding solutions without nitroguanidine. The pickling time can be measured by watching the outgassing of hydrogen gas out of the phosphate solution bath, coming from the reaction of the acidic phosphate solution with the metallic surface. The gas bubbles can be easily observed in the lab. This gasing time, which seems to be identical with the pickling time of that reaction, is only about 2 to 3 minutes with nitroguanidine and about 5 to 6 minutes without nitroguanidine.

7. Because of the shorter pickling time, the pickling effect is smaller, resulting in less and smaller pickling pits and holes in the metallic surface, which also influences the roughness of the coating generated thereon. At the end of the pickling reaction, the phosphate coating is relatively continuous with the generated crystals, and there is only a minor chemical reaction going on at this point. More and finer crystals are generated by the presence of nitroguanidine in the phosphate solution. Therefore, the roughness R_z of the generated phosphate coating is significantly smaller. The lower roughness R_z results from the finer crystals of the phosphate coating and from the less rough pickled metallic surface. The crystal sizes can be observed with a scanning electron microscope. It is my understanding that such photographs were already filed as enclosures with another Declaration filed in connection with this application. The typical roughness R_z of manganese phosphate coatings containing nitroguanidine according to the present application is about 1.3 to 2.5 μm , but without a content of nitroguanidine in the corresponding solution it is typically about 5 to 6 μm .

